Title: Dairy and Beef Biting and Nuisance Fly IPM Meeting Series – 2015

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Cooperators: Cornell Cooperative Field Crop Extension Educators

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Project location: New York State

Abstract
A series of on-farm summer field meetings were held for dairy and beef producers to increase awareness of issues and IPM approaches to manage nuisance and biting flies on dairy cattle and other animal.

Background and Justification
Dairy production is an integral component of many rural communities in the northeastern US, helping to sustain the economic viability of our region. In New York, 5,700 dairy farms were in production in 2010 contributing nearly $1.6 billion in dairy products to the state's economy (NY NASS, 2010). In 1997, northeast U.S dairy and beef cattle associated revenues totaled $4.4 billion (USDA Census of Agriculture, 1997). Additionally, the value of these commodities in the eastern US, where the results of this project are most applicable, total $ 15.4 billion.

Biting and nuisance flies, and external parasites adversely affect animal health, productivity and reduce farm profitability. A complex of pests is usually involved, which can differ in the intensity of direct and indirect host effects. Damage from infestations of summer and winter active arthropod pests of dairy and beef cattle in the U.S. have been estimated to exceed $2.26 billion in losses annually (Byford et al. 1992).

In a 1997 survey of New York dairy farmers, twenty-eight percent of respondents indicated flies in and around barn areas were most difficult to control and 43% indicated animal confinement area flies were the most likely to cause economic loss (Harrington et al. 1998). Flies in and around the barn were treated with an insecticide an average of once a week. Most respondents (80-90%) employed cultural practices such as manure removal, while less that 5% of respondents released beneficial insects to manage barn flies. In this same survey, 52% of respondents selected flies on pastured cattle as being the most difficult pest to control and 56% indicated pasture flies were the most likely to cause economic loss (Harrington et al. 1998). Additionally, dairy farmers reported using insecticides two to three times per month to manage flies on pastured cattle.

Several challenges currently face those seeking to effectively manage livestock pests today. Implementation of the 1996 federally mandated Food Quality Protection Act (FQPA) resulted in the removal of a number of commonly used livestock insecticide materials, such as dimethoate, naled and chlorpyrifos. In the last decade, relatively few new insecticides have been registered

for use on livestock. Efforts by the Cornell University Veterinary Entomology research group have documented widespread insecticide resistance in house flies, a primary pest on livestock operations (Kaufman, et al. 2001). In some cases, 100% of house flies treated with specific insecticides survived when treated with the legal application rate of insecticides. The combination of fewer insecticides available and an increased presence of insecticide resistance heighten the potential for effective pest management options.

To complicate matters, as suburban areas encroach on rural agricultural landscapes, emigration of pest flies to off-site locations can act as a community lightning rod creating a new set of challenges for those involved in animal agriculture. This results from potential public health concerns and nuisance complaints from neighboring communities.

Individuals relying upon a largely insecticide-based pest management strategy will find this tactic an inadequate approach to controlling these pests. With fewer insecticides available, prospects for new materials limited, insecticide resistance more prevalent, and urbanization of once rural areas becoming more common place, livestock producers will continue to face increased challenges with fly management in the future.

These issues highlight the need for producers to have the best information available to manage dairy cattle pests and to utilize a broad integrated approach that includes a variety of cultural, biological, physical and chemical tactics.

Adult learning research indicates producers are more likely to adopt targeted new practices when the educational design promotes small groups, open discussion, and experiential hands-on learning on the farm (Kolb 1984, Koontz et al. 1994, Richardson 1994, Rogers 1983). Having the IPM dairy field meetings on a local producer's farm and inviting the local dairy farmers creates a trusting atmosphere. Producers are more inclined to adopt new methods of pest control when they can see and do it on their own farm. A series of field meetings were held to extend dairy cattle IPM information to better manage common nuisance and biting flies attacking animals on dairy pasture and in confinement areas.

Objectives:

1. To increase the number of producers utilizing livestock IPM by increasing the number, awareness and IPM skill level of dairy producers and other agriculture professionals in the New York.
2. Evaluation of producer adoption will provide indications on the effectiveness of current educational efforts and identify strengths, weaknesses and opportunities to improve on training approach, impact, and producer use of IPM methods.

Procedures:
We had 5 on-farm across New York to provide 83 producers, extension personnel, veterinarians and others with an overview of dairy and beef cattle IPM principles and practical approaches to managing common fly pests affecting cattle on pasture. These presentations were followed by an in the field demonstration and hands-on experience. By actively engaging individuals through seeing and doing, producers are more willing to adopt many of the new procedures and practices being taught on farms. We teamed with extension educators with direct connection to local producers in several areas of New York to strengthen outreach and potential impact. A typical meeting agenda is in Appendix 1.

As part of the program's activities and to enhance discussion, several examples of commercially available pasture and barn fly traps (sticky glue traps, alsynite, knight stick, Horse Pal and Epps biting fly traps) were installed at each location prior to the meeting. Meetings were advertised locally by the host extension educator.

Results and Outcomes:
A total of 5 IPM meetings were held in New York during 2015. (Table 1).

Table 1: Meetings conducted by date, location, audience and number of people attending.

Date	Topic	Location	Audience	Participants
1/14-15/15	Fly Mgmnt in Animal Agric. Systems and Impacts on Animal Health & Food Safety	Baton Rogue, LA	USDA – Annual Multistate Project S-1060	31
4/21/15	Overview of Pastured Beef Cattle IPM	Ovid, NY	Producers	25
6/23/15	Overview of Pastured Dairy Cattle IPM	Taberg, NY	Producer	18
6/30/15	IPM Approach to Managing Beef on Pasture	Lyons, NY	Producers	28
7/10/15	Livestock Pasture and Barn Fly IPM	Gardener, NY	Producers	7
9/15/15	Livestock Pasture and Barn Fly IPM	Clinton Corners, NY	Producers	5
			TOTAL	114

The primary focus of the meetings was use of IPM related to barn and pastured dairy and beef cattle fly issues. The majority of particpants were livestock producers, in addition a few participants also raised horses, goats, sheep or other livestock. A few veterinarians, USDA livestock inspectors and agribusiness personnel also attending the meetings.

Twenty participants completed post-program evaluations that attended the meetings. The results of these evaluations follow. The actual questionnaire can be found in Appendix 2. The dairy and beef producers attending the cattle (beef and dairy) fly IPM meetings reported owning and managing about 670 cattle. There were also 2 producers in attendance that owned and managed 165 head of sheep. Horn, stable, house and face flies were the predominant fly species participants observed on their pastured and confined livestock. Participants indicated they felt face, stable, house and horn flies cause economic losses to their animals.

All participants responding to the program evaluation questionairre either highly agreed or moderately agreed that the meetings helped them better understand management of fly pests on pasture or in and around the barn.

Prior to the all of the on-farm meetings 88% of respondents reported they did not use IPM thresholds in making fly management decisions. Following the meeting 100% of the participants indicated they would use or try to use IPM thresholds in their fly management strategies.

Table 2: The percent of participants that use of IPM thresholds (N=7)

	Used IPM Thresholds	Did not use IPM Thresholds
Before Meeting	18%	88%
	Will use thresholds or try to use.	Will not use thresholds
After Meeting	100%	0%

Table 3: The number of respondents indicating specific fly management practices used prior to this meeting and what they will use (or consider using) after this meeting.

Fly Management Practice	**Before meeting**	**After meeting**	**Will Try**
Fly Parasitoids	2	1	
Alsynite Biting Fly Trap		7	3
Epps Trap		1	
Horse Pal		1	2
Knightstick *Biting Fly Trap*			1
Back rubbers	4	2	1
Dust Bags	3	2	
Repellents	4	3	
Walk through trap		2	
“Cow vac” Fly Trap		1	

	
Alsynite Biting Fly Trap for stable fly management	Horse Pal Horse Fly Trap for horse and deer flies
	
Portable Epps Biting Fly Trap for horse and deer flies	Bruce Style Walk-Through Fly Trap for face and horn flies
	
Cow Vac Horn Fly Trap- for horn flies	Knight Stick Stable Fly Trap for stable fly management

Participant comments regarding the fly IPM Meetings are shown in tables 5, 6 and 7.

Table 5: Comments made by participants responding to:
"Is there something new I learned from this presentation?

- Many different traps available
- Parasite control methods
- Everything was excellent
- Very nice presentation learned a bunch, thanks!
- Fly ID, control
- Life cycle variations of face/horn/stable flies
- Fly reproduction, blue color attraction
- All the different flies
- Male/female flies do different things – life cycle preferences/actions
- -Good understanding of fly species and how to manage them.
- Made me more aware of fly management products on the market
- Good presentation
- Very interesting, first time hearing some of this information
- Nice presentation, very informative!

Table 6**:** Comments made by participants responding to:
"What did you like most about this meeting?"

- Easy going, relaxed information, hands-on
- Hands-on
- In pasture on-site
- Multimodal Approach
- Hands-on
- Instead of sitting in a room looking at pictures of flies we actually got to see them and fly larvae.
- Thank you and very helpful.

Table 7: What research-based dairy fly information would you like to suggest to better meet your needs?

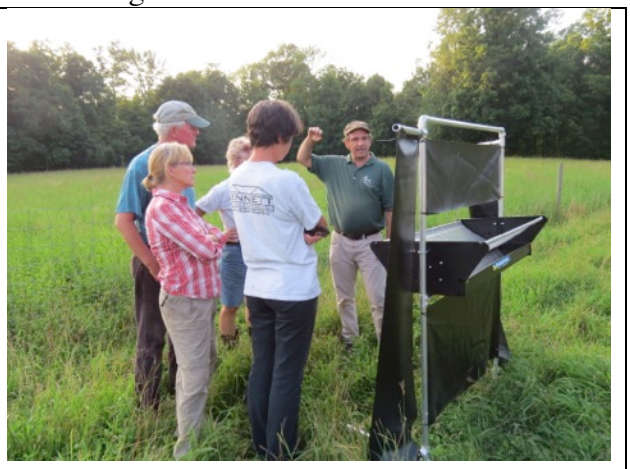
- Efficacy of different ear tags
- More trap information
- Continue IPM
- Organic

In addition to this years on-farm grower meetings a “NYS Livestock IPM Update” and an Overview of the NYS Dairy IPM effort: “NYS Dairy Cattle IPM: Research and Outreach Addressing Dairy Industry Needs” were presented at the USDA-NIFA S1060 and Fly Management in Animal Agric. Systems and Impacts on Animal Health & Food Safety annual meeting in Baton Rogue, LA and the 8th International IPM Symposium in Salt Lake City UT, respectively.

Summary:
Dairy fly IPM on-farm meetings were held in 5 New York counties during the summer of 2015. These events were successful in sharing dairy cattle/livestock IPM information with 83 participants. The meetings helped participants learn IPM principles and practices as applied to management of dairy biting and nuisance flies. The meetings were held on farms and employed an experiential learning approach with hands-on opportunities. Farmers preferred the on-farm in the field environment. Producer responses indicated they greatly appreciated the interactive and participatory learning approach of these meetings personalized to their specific farming environment. Participation in the national IPM events provided networking opportunities and input from veterinary entomologists, extension, industry personnel and other professionals.

Pasture Fly IPM Meetings

Participants learning how effective an alsynite stable fly trap can be.



Participants learning how to use an Epps Biting Fly Trap for horse and deer flies.

Participants learning how to use a Horse Pal Fly Trap for horse and deer flies.	Participants learning about the importance of dung beetles in competing with horn and face fly maggots for resources in the manure pat.

Various commercially available biting fly traps were demonstrated at summer cattle fly IPM meetings. There was a lot of interest in using traps like these to control biting flies on both beef and dairy cattle.

Barn Fly IPM Meetings

	
Participants are learning not to leave hay on the ground for an extended period of time because it makes for good habitat for stable and house flies to reproduce.	Participants are learning that edge of manure piles can be good habitat for stable and house flies to reproduce. In ideal cases one handful of moist decomposing organic material can produce a 1000 flies.

	
Participants are learning how to use large sticky fly glue traps in the barn for house flies.	A meat processing demonstration (& BBQ) at one of last summer's Beef IPM field meetings.

This depicts the hands-on approach used during summer 2015 barn fly IPM meetings. Participants are engaged and learn to identify and assess "real" on-farm fly issues and what to do to minimize fly numbers by managing them using an array of IPM tactics.

Key Words: Stable fly, house fly, face fly, horn fly, deer fly, horse fly, dairy, cattle, IPM, integrated pest management, on-farm education.

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Appendix 1: Flies Affecting Animals on Pasture Meeting Agenda(Hour 1)

-Conduct a fun "Pasture Fly Quiz" with Participant

Importance aspect of Pasture Fly IPM:

-Animal Health,
-Economic Impacts
-Population Growth
-Pesticide Resistance
-Food Quality and Protection Act
-On / Off Site fly emigration and other effects

Identification and Biology of Horn Flies, Face Flies and Stable Flies.

-Similarities and Differences
-Management lies within the Biology for the flies
-All flies are not created equal - other potential pests

Integrated Management

-Monitoring Techniques & Threshold Guides
- Fly Trapping Technology (What can they do?)
-Natural Enemies are They Effective?
-Chemical Control, back-rubbers, sprays, ear tags
-Insecticide Resistance Management
-Organic repellent Sprays-Do they Work?

Pasture Walk (1 Hour)

-Bio-security Issues
-Overview of Farm / Animal Production operation -host farmer or CCE personnel
-Pasture walk with eyes on fly managements issues, challenges, opportunities, how-to's, where's, whys, hands-on demonstration(s), other FAQ's
- Discussion
-Review answers to Pasture Fly Quiz

Appendix 2 – Blank Questionnaire

NYS IPM Pastured Cattle –Fly Management Evaluation

1. What type of animals do you pasture?
   __Dairy Cattle __ Beef Cattle __ Horses _____ Other
2. What is the size of your herd? _____ How many acres do you pasture _____?
3. What insect pest appears to be most common on your pastured animals?
   Horn Fly ___, Stable Fly ___, Face Fly ___, Deer Fly ___, Horse Fly___ Other (name) ___
4. What insect pests do you feel cause economic loss to your animals?

Horn Fly ___, Stable Fly ___, Face Fly ___, Deer Fly ___, Horse Fly___ Other (name) ____

5. Do you use action thresholds to determine if flies on you animals need to be managed?

Before this meeting	After this meeting
Yes ___, No ___	Yes ___, No ___

6. What fly management practices did you use prior to this meeting and what will you use (or consider using) after this meeting for pastured animals:

		Before the meeting	After the meeting
		Check only 1 per column	
a.	Epps Trap	Yes ____ No ____	Yes ____ No ____
b.	Horse Pal Trap	Yes ____ No ____	Yes ____ No ____
c.	Alsynite Trap	Yes ____ No ____	Yes ____ No ____
d.	Walk Through Trap	Yes ____ No ____	Yes ____ No ____
e.	Repellents	Yes ____ No ____	Yes ____ No ____
f.	Back rubbers	Yes ____ No ____	Yes ____ No ____
g.	Pour-on	Yes ____ No ____	Yes ____ No ____
h.	Feed through	Yes ____ No ____	Yes ____ No ____
i.	Ear tags	Yes ____ No ____	Yes ____ No ____

7. Will you reduce the use of insecticides because of this meeting?

   Yes _____ No _____

8. This meeting helped me better understand the fly management issues of cattle on pasture.

Highly agree	Moderately agree	Not Sure	Moderately Disagree	Strongly Disagree
_____	_____	_____	_____	_____

9. Please indicate how this meeting might have improved you pasture fly management practices?

10. What did you like most about this meeting?

11. Where can we improve on research based information to better meet your needs as a producer?

12. What state do you farm in? _____